

2017 Winter Wheat Field Crop Trials Results



Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

The success of a winter wheat variety depends largely on its ability to survive Minnesota winters. Research on the northern plains has shown that planting winter wheat in stand-

ing stubble using no-till methods will decrease winterkill considerably. A stubble height of 4 to 6 inches is ideal but even shorter soybean stubble provides some protection. Trapped snow

provides insulation that increases the odds that the young seedlings will survive.

These performance evaluations are not designed for crop comparisons,

Table 1. Agronomic characteristics of winter wheat varieties.

Entry	Agent or Breeder ¹	Year of Release	Class ²	Legal Status	Winter Hardiness ³	Days to Heading ⁴	Plant Height ⁵	Straw Strength ⁶	Test Weight ³	Grain Protein ³
(1-9)										
AAC Gateway	Seed Depot	2012	CWRW	PVP(94)	2	7	1	1	6	3
AC Broadview	Meridian Seeds	2008	CWRW	PVP(94)	2	7	1	3	8	6
AC Emerson	Meridian Seeds	2010	CWRW	PVP(94)	1	7	3	1	6	3
Branson	Syngenta	2005	SRWW	PVP(94)	3	1	1	2	9	9
CDC Chase	Canterra Seeds	2013	CWRW	PVP(94)	2	6	7	3	5	4
Decade	MT/NDSU	2010	HRWW	PVP(94)	2	5	1	2	8	6
Flourish	SeCan	2010	CWRW	PVP(94)	3	5	2	2	9	5
Freeman	USDA-ARS/NE	2013	HRWW	PVP Pending	2	1	2	3	9	7
Ideal ⁷	SDSU	2011	HRWW	PVP(94)	1	4	2	—	2	9
Jerry	NDSU	2001	HRWW	None	2	7	5	3	7	6
Keldin ⁷	WestBred	2011	HRWW	PVP(94)	4	4	3	—	4	3
LCS Link ⁷	Limagrain Cereal Seeds	2017	HRWW	PVP Pending	2	1	2	—	1	9
Loma ⁷	MT	2016	HRWW	PVP Pending	2	6	1	—	3	6
Moats	SeCan	2010	HRWW	PVP(94)	3	8	5	3	5	2
Northern ⁷	MT	2015	HRWW	PVP(94)	2	6	1	—	4	7
Oahe ⁷	SDSU	2016	HRWW	PVP Pending	1	2	5	—	3	7
Overland	NE	2006	HRWW	PVP (94)	2	4	3	2	6	6
Redfield	SDSU	2013	HRWW	PVP(94)	2	5	2	3	6	5
Ruth	NE	2015	HRWW	PVP Pending	2	3	3	2	7	7
SY Monument ⁷	Syngenta	2014	HRWW	PVP(94)	1	2	2	—	4	9
SY Sunrise ⁷	Syngenta	2015	HRWW	PVP(94)	2	1	1	—	3	7
SY Wolf	Syngenta	2010	HRWW	PVP(94)	2	3	1	2	7	5
Warhorse ⁷	MT	2013	HRWW	PVP(94)	2	6	2	—	4	6
WB4614	WestBred	2013	HRWW	PVP(94)	1	3	1	3	9	3
WB-Grainfield	WestBred	2013	HRWW	PVP(94)	2	1	1	4	6	6
WB-Matlock	WestBred	2010	HRWW	PVP(94)	1	6	3	2	5	4
LSD (0.10)					1	1	1	1	2	1

¹MT = Montana State University, NDSU = North Dakota State University, NE = University of Nebraska/Husker Genetics, SDSU = South Dakota State University, USDA-ARS = USDA Agricultural Research Service.

²CWRW = Canadian Western Red Winter Wheat, HRWW = Hard Red Winter Wheat, SRWW = Soft Red Winter Wheat.

³1 = highest 9 = lowest.

⁴1 = earliest 9 = latest.

⁵1 = shortest 9 = tallest.

⁶1 = least prone 9 = most prone.

⁷Estimate based on 2017 year data.

because the spring and winter wheat trials are grown on different fields and with different management. The data should be used only to compare varieties within a table. Nonetheless, yield potential of winter wheat—if the crop maintains a stand of 23 plants per square foot or better—is routinely higher than spring wheat, especially in the southern half of the state.

The results of the variety performance evaluations are summarized in Tables 1 through 3. The winter wheat performance trials were grown near Roseau, Crookston, Kimball, St. Paul, Le Center and Lamberton in 2017. The trials near Roseau and Kimball were lost completely while the other locations showed varying degrees of winter survival, resulting in variable stands within the plots. This in turn increases the experimental error. Ultimately this hampers the ability to detect differences between varieties as illustrated

by the relatively large LSD values.

Winter hardiness, relative maturity (as measured by the number of days to heading), plant height, and resistance to lodging have been converted to a 1-9 scale to allow for easier interpretation of the data (Table 1). Differences for all four characteristics are generally much less in the southern half of the state. In the northern half of the state the gap in characteristics widens. Presenting averages of the actual data therefore can be misleading. Varieties with lodging scores greater than 4 should be chosen with caution as lodging can reduce harvestability, yield and quality. This is especially important if your soils are highly fertile.

While all winter wheat varieties should be considered susceptible to very susceptible to Fusarium head blight (scab), they head earlier than spring wheat varieties and thus have

a chance of escaping losses in grain yield and test weight and the presence of deoxynivalenol or vomitoxin, a major food safety concern that can result in steep discounts. AC Emerson, Moats, and Redfield provide the best genetic resistance among winter wheat varieties (Table 3). However, still consider these varieties to be more susceptible to Fusarium head blight than most spring wheat varieties. Most winter wheat varieties are also susceptible to very susceptible to the leaf diseases—including powdery mildew. Disease ratings for leaf diseases, stripe, leaf and stem rust and scab are provided by North Dakota State University. Limited data on powdery mildew as observed in trials across Minnesota in 2015 and 2016 is also presented. Research results in the region indicate that fungicides to control leaf diseases early in the season and suppress scab at anthesis are

Table 2. Relative grain yield of winter wheat cultivars in Minnesota in single year (2017) and multiple year comparisons (2015-2017).

Entry	Lamberton		Le Center		St. Paul		Crookston		State ¹	
	2017	3 Yr	2017	3 Yr	2017	3 Yr	2017	3 Yr	2017	3 Yr
AAC Gateway	114	111	114	104	91	114	126	118	102	111
AC Broadview	101	102	94	91	87	98	98	100	90	95
AC Emerson	81	99	78	85	73	81	87	99	78	89
Branson	75	78	120	125	92	86	111	104	95	109
CDC Chase	99	115	78	90	83	85	86	100	86	97
Decade	84	98	95	95	97	97	95	96	96	93
Flourish	98	105	129	109	104	115	88	98	104	104
Freeman	83	94	92	110	122	120	114	98	113	113
Ideal	112	—	97	—	103	0	113	—	103	—
Jerry	66	84	76	89	73	80	79	92	76	88
Keldin	124	—	111	—	120	—	68	—	113	—
Loma	109	—	85	—	99	—	102	—	99	—
LCS Link	114	—	117	—	113	—	103	—	112	—
Moats	104	113	89	93	95	80	95	97	97	95
Northern	116	—	84	—	111	—	89	—	105	—
Oahe	104	—	97	—	102	—	97	—	99	—
Overland	107	110	111	111	102	117	97	104	103	111
Redfield	109	112	101	106	114	140	111	101	111	116
Ruth	115	113	123	123	109	110	109	99	109	112
SY Monument	114	—	107	—	127	—	110	—	119	—
SY Sunrise	102	—	130	—	106	—	105	—	107	—
SY Wolf	87	103	143	115	120	123	116	108	114	115
Warhorse	102	—	96	—	106	—	111	—	105	—
WB-Grainfield	94	81	115	119	108	110	100	83	106	102
WB-Matlock	100	101	92	96	89	110	106	111	92	105
WB4614	118	101	85	82	104	84	95	98	103	83
Mean (Bu/Acre)	107.6	88.9	85.5	92.8	71.2	53.7	89.1	71.3	88.6	63.5
LSD (0.10)	23	16	23	11	13	17	27	14	9	8

¹Includes data from trials in 2016 near Roseau and data from trial in 2015 and 2016 near Kimball.

nearly always warranted and should be considered an integral part of your production practices.

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Test Plot Managers

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Winter Wheat

Planting Rate and Date

- Bushel Weight, Pounds.....60
- Seeds/Pound.....14,500
- Planting Rate, Pounds/Acre.....75+
- Planting Rate, Seeds/Sq. Ft.....25
- Planting Date.....Sept. 1 - Oct. 1

Table 3. Disease reactions to economically important diseases of winter wheat.

Entry	Powdery Mildew	Leaf Spotting		Stripe Rust	Leaf Rust ²	Stem Rust ²	FHB ²
		Diseases ²	(1-9)				
AAC Gateway	3	7	2	4	1	6	
AC Broadview	5	-	4	1	1	9	
AC Emerson	4	5	1	6	1	4	
Branson	1	-	2	-	-	-	
CDC Chase	4	-	1	1	1	6	
Decade	6	4	8	9	1	9	
Flourish	4	7	2	6	6	8	
Freeman	4	-	-	-	-	7	
Ideal	-	4	4	1	3	8	
Jerry	3	8	8	3	1	8	
Keldin	-	-	2	-	-	-	
Loma	-	-	1	-	1	8	
LCS Link	-	-	-	-	-	-	
Moats	4	7	1	1	1	3	
Northern	-	6	1	8	1	8	
Oahe	-	-	2	3	6	-	
Overland	4	4	3	2	3	8	
Redfield	3	-	4	6	8	3	
Ruth	5	-	6	-	-	8	
SY Monument	-	-	3	3	-	6	
SY Sunrise	-	-	3	-	-	6	
SY Wolf	3	1	3	4	1	6	
Warhorse	-	-	-	-	-	-	
WB-Grainfield	5	6	6	6	-	8	
WB-Matlock	3	-	6	6	1	6	
WB4614	6	-	1	-	-	8	
LSD (0.10)	1						

¹Includes tan spot and Septoria complex.

²Data provided by NDSU.

³1 = most resistant 9 = least resistant.